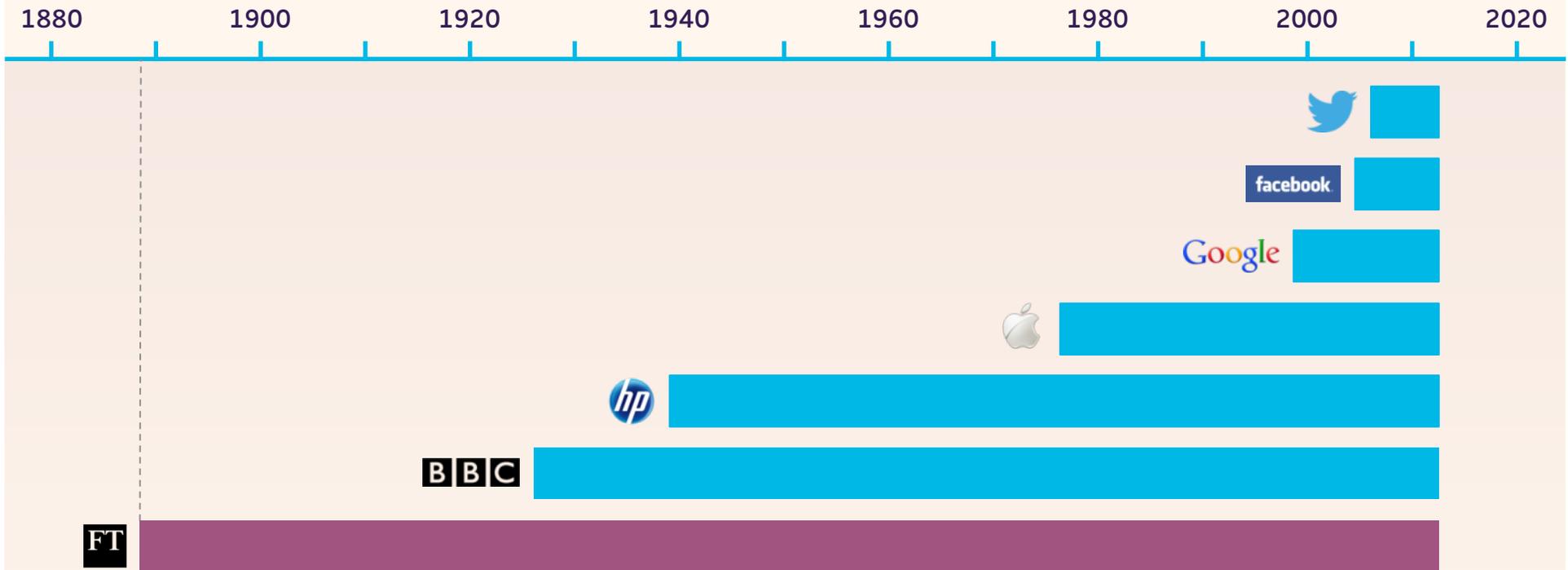




The FT Web App: Coding responsively

Dr Robert Shilston (rob@labs.ft.com)
Director, FT Labs (@ftlabs)

Historical comparison



FT WEEKEND

FINANCIAL TIMES | Saturday May 16 / Sunday May 17 2009 | £2.50

READER OFFER
Win a theatre trip to London and New York
 Turn to Page 9 for details of how to enter

HOW TO SPEND IT
Magazine travel special
 Destinations to dream about



Square deal Fame for an hour on London landmark



Artist Antony Gormley sits in Trafalgar Square with some of the people who will stand on the empty fourth plinth in the London landmark public space as part of a project conceived in a portrait of the UK in 2009. The project will see a different person occupy the plinth every hour of the day from July 6 to October 14.

Investors face cut in M&S dividend

By Elizabeth Biggy, Andrea Falsted and Kate Burgess

Investors are bracing for Marks and Spencer to cut its dividend next week, with some analysts expecting the retailer to reduce its full-year pay-out by as much as half.

Morgan Stanley, the house broker, expects the full-year pay-out to be halved from 22.5p last year to 11.2p this time, ending an eight-year run of increased dividends. Others are predicting a reduction of 20-30 per cent.

People close to the retailer acknowledged that the level of dividend paid last year, when M&S broke the 10p profit mark, was no longer sustainable given that the retailer was expected to reveal a fall of 40 per cent in pre-tax profits for the year to March after tough trading.

One person familiar with discussions over the dividend said it might be more prudent to cut in a few months' time if the hoped-for "green shoots" of recovery did not emerge. The board will meet on Monday and announce the outcome on Tuesday.

While institutional investors are resigned to a cut, retail shareholders, who make up 21 per cent of the shareholder base, are likely to be unhappy to see their M&S pay-outs slashed on the day of the 100th birthday

Inside
 Simon Schama on America's phobia of banks
Life & Arts
 Cover Story

Can't sell? Should you swap instead?
Home & Home
 Cover Story

Tom Stoppard on revisiting a Chekhov classic
Life & Arts
 Page 7

News Briefing
 Vodafone tightens its focus on slashing costs
 Vodafone is set to use its full-year results next week to announce an acceleration of its 2009 cost-cutting programme as it grapples with competitive and resource pressures to

Low interest rates hit savers

FT lists 50 worst 'near-zero' offenders

an investigation into bank advertising that would cover such accounts.

In one example, the "Sovereign 30" account offered by Cetero, a private bank, pays zero interest on balances up to

£100,000. The bank also offers a "Sovereign 30" account with a 2.75 per cent rate, but such

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Newsprint

Works offline

Portable

Long battery life

Can be read in bright sunlight

Cheap

Ubiquity

Bookmarking

Sharing

Fast start up

Clipping/saving

~~Can be read in the dark~~

~~Updates in real time~~

~~Electronic delivery~~

~~Search~~

~~Personalisation~~

~~Deep linking~~

'Traditional' web

~~Works offline~~

~~Portable~~

~~Long battery life~~

~~Can be read in bright sunlight~~

~~Cheap~~

~~Ubiquity~~

Bookmarking

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~~Deep linking~~

HTML5 is **not** a 'mobile thing'.
It's **not** an alternative to native
apps.

It's a way of making **better**
websites.



Welcome back to the web

The FT web app provides a touch optimised user experience without native code.

Sometimes it's

what we've done

But we've learned a lot, so to be honest sometimes it's

**what we would do if we did it
again.**

Agenda

- Coding responsively
 - Layout and interactions
 - Connection state
 - OS
- Development process
 - Branching and feature flags
 - Testing and deployment

But first, let's consider:

What is an app?

What is an 'app'?

- Built for a single platform
- In an app store
- Written in native code
- Built for mobile
- Designed for touch interaction

NO THANKS

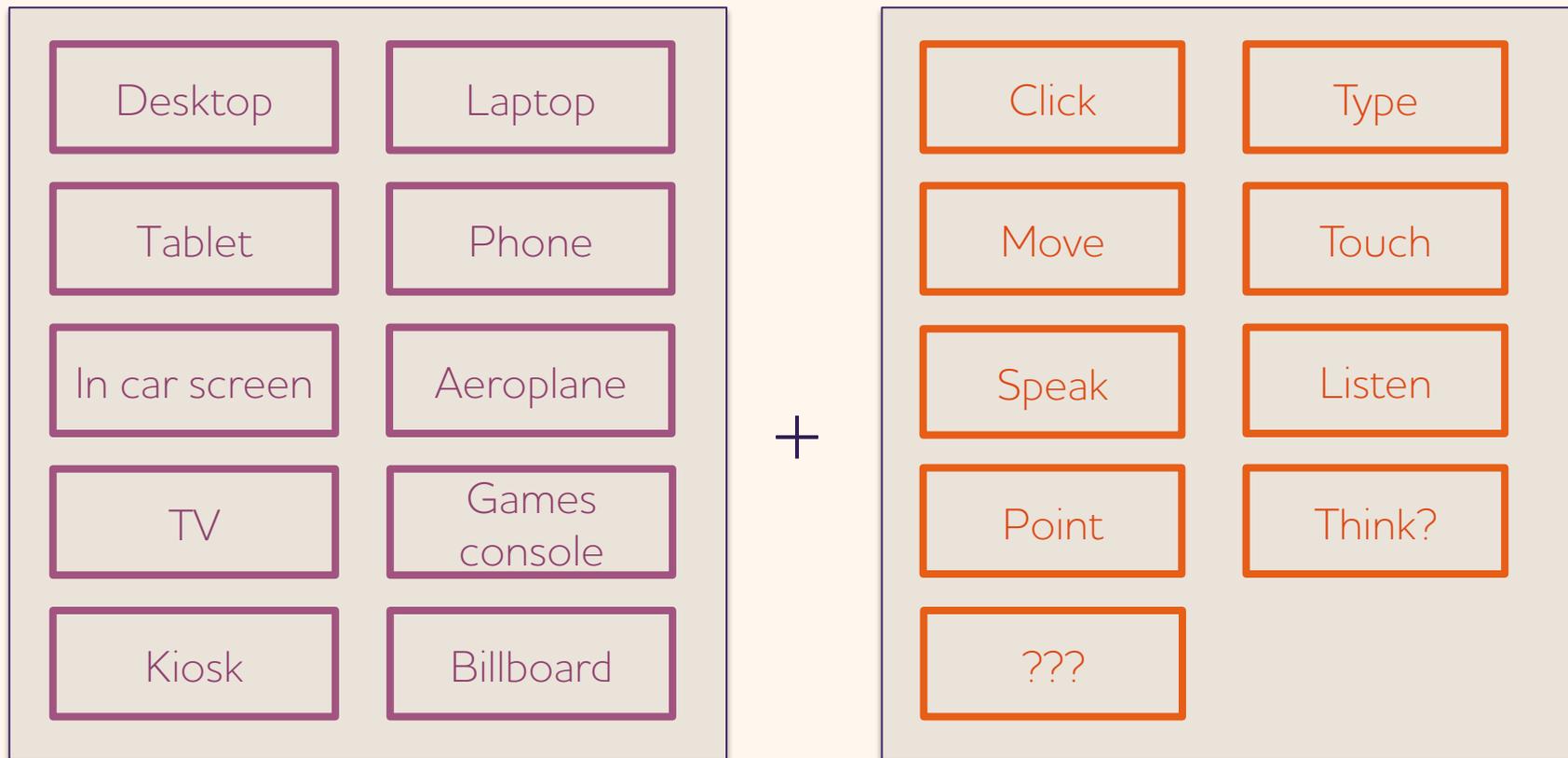
What an 'app' is to us:

app (n). a distributed computer software application designed for optimal use on specific **screen sizes** and with particular **interface technologies**,

So let's start:

Why code responsively?

How an app might run



Layout and interactions

- Screen size
 - Not the same as resolution
- Instant touch feedback
- Click and mouse hover effects
- Keyboard shortcuts
- Reading experience
 - Easier to read narrow columns
 - Paragraph leading and guttering

Flowed columns

8:40 AM Friday

Weber named next UBS chairman

By Haig Simonian in Zurich

Axel Weber is to be the next chairman of UBS, resolving succession issues at the Swiss banking group and removing any possibility the former Bundesbank president might take a top executive role at Deutsche Bank.

Mr Weber, who will receive a one off "golden hello" of SFr2m (\$2.4m) along with 200,000 UBS shares which he will be prevented from selling for a year, was once tipped as the likely successor to Jean-Claude Trichet at the European Central Bank.

Kaspar Villiger, a former Swiss finance minister and current UBS chairman who stepped in to restore stability to the bank after the ravages of the credit crisis, has regularly stressed his awareness of succession issues.

Apart from a successor to the chairman, who is aged 70, the board has also acknowledged the need to plan ahead for



	LAST	TODAY'S CHANGE	1 MONTH CHANGE
Deutsche Bank ... As of Jul 01 2011 1...	41.98	+1.33	+2.28%
	EUR	+3.26%	
UBS AG As of Jul 01 2011 1...	15.69	+0.36	-4.21%
	CHF	+2.35%	

a successor to Oswald Grübel, the former veteran Credit Suisse chief executive who came out of retirement to take the same job at UBS. The bank made no mention of Mr Grübel, aged 67, but it has been widely assumed in Switzerland that resolution of Mr Villiger's succession would be followed by that of the chief executive.

Mr Weber will receive a base salary, UBS shares and benefits in kind. As deputy chairman, he will receive SFr1.5m a year, and 150,000 UBS shares, blocked for four years. On becoming chairman, his annual pay will rise to SFr2m and the share entitlement to 200,000.

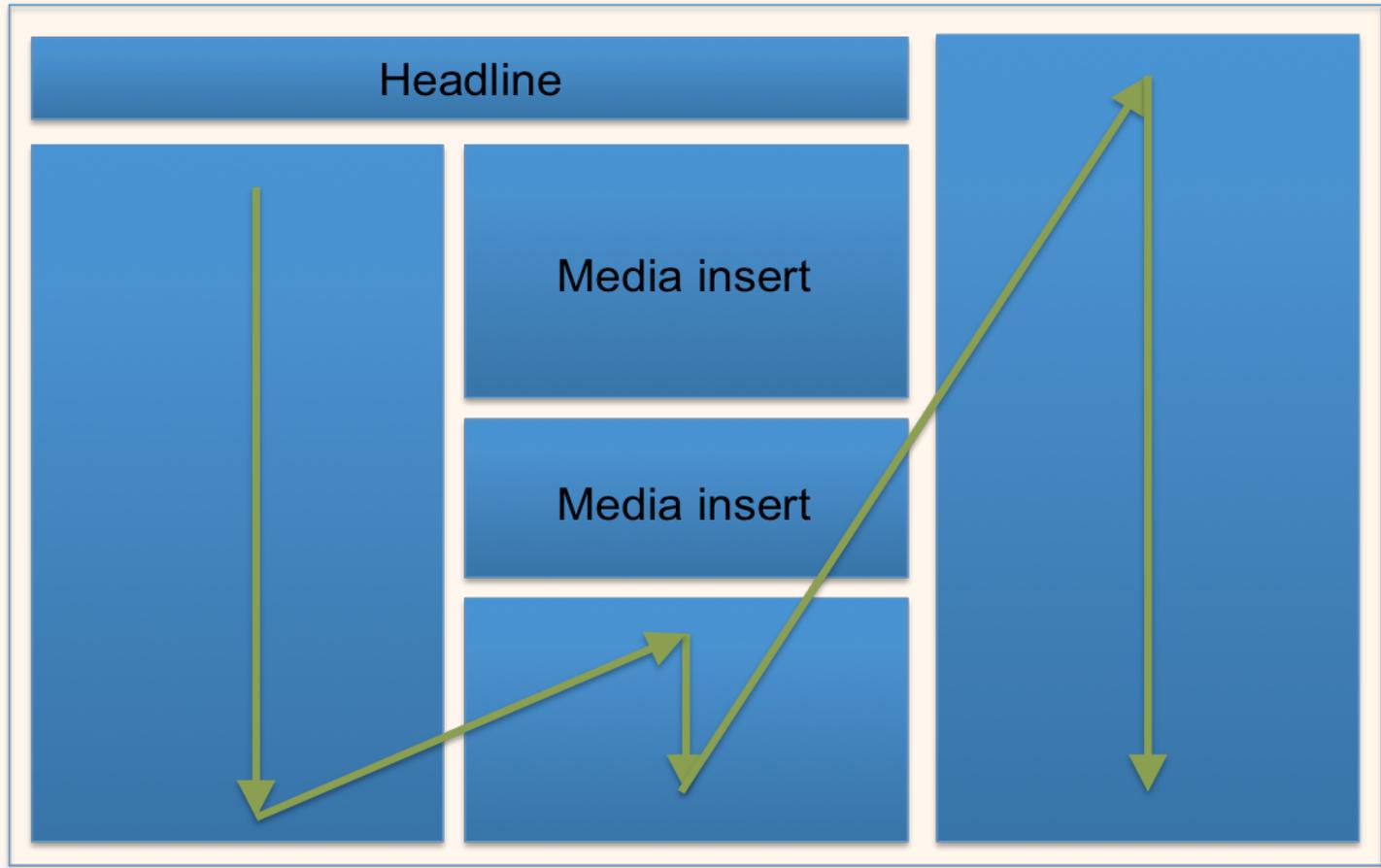
By comparison, when Mr Villiger was appointed chairman, while the bank was still heavily in loss, he emphasised he would take the standard SFr850,000 salary of a Swiss cabinet minister. Since then, his pay and benefits have edged up to almost SFr1.5m.

"With Axel Weber's nomination, I am pleased that I can present a board member and future chairman who is an internationally renowned personality with an outstanding reputation", said Mr Villiger.

"He has extremely broad expertise in international finance and banking as well as strong leadership experience. His appointment will guarantee a smooth leadership transition and stability."

Dirk Becker, an analyst at Kepler Capital Markets, said the appointment of Mr Weber would bring the Swiss bank

Flowed columns



Scroller

Fork me on GitHub

The screenshot shows the Financial Times mobile app interface on an iPad. At the top, the status bar displays 'Carrier', signal strength, '1:14 PM', and '100%' battery. Below the status bar, there is a navigation bar with 'You are signed in' and 'Your account' buttons, along with settings and search icons. A secondary navigation bar contains tabs for 'Front page', 'Companies', 'World', 'Markets', 'Lex', 'Comment', 'Management', and 'Life & Arts'. The main content area features the 'FINANCIAL TIMES' logo and a 'MENU' button. Below the logo, there are three news snippets: 'Republican rethink' with a photo of Mitt Romney, 'Four more years' with a photo of Barack Obama, and 'DOW' with market data. A red banner indicates 'United States iPad edition'. At the bottom, the main headline reads 'Barack Obama sweeps to victory' with a timestamp of '7:28 AM'. To the right, it says 'Last updated: 11:33am' and includes a 'Refresh' button. Below the headline, there is a 'Global market map' link.

Carrier 1:14 PM 100%

You are signed in Your account

Front page Companies World Markets Lex Comment Management Life & Arts

FT

FINANCIAL TIMES

REPUBLICAN rethink
Party has some hard thinking to do

FOUR more years
Obama must make renewed bipartisan effort

DOW
Closes in 1 hr 27 min
-2.03% to 12,977

United States iPad edition

7:28 AM

Last updated: 11:33am Refresh

Barack Obama sweeps to victory

Global market map

Fastclick

- Speed up touch interactions
- Eliminates 300ms lag

```
<script src='fastclick.js'></script>
```

```
window.addEventListener('load', function() {  
    new FastClick(document.body);  
}, false);
```

Connection state

Or why **online and offline** events should not be trusted to answer the question 'are we online?'

navigator.onLine

Are you online if?

- You've got wifi signal?
- You've got 3G signal?
- If DNS resolves?

If Twitter loads?

- Will my site?
- Will Facebook?

Q: If the value of **navigator.onLine** is **true**, what does that mean?

A: The device **might** be online.

For when there's no connection

- AppCache
 - Essential for offline functionality
 - Just use it to bootstrap your app.
- LocalStorage
 - Great for code and templates
- Cookies
 - Shared with the server
 - Included in every request
- WebSQL / IndexedDB
 - Great for content





HTML5 AppCache for initial page load

Beware. AppCache needs careful handling.

LocalStorage for code and templates

Cookies for data shared with the server

WebSQL / IndexedDB for news content

Squeezing your bits

- Devices tend to limit HTML5 storage
- Storing images offline:

Base64 encoded data-URIs
+ UTF-16 storage encoding
= Inefficient



An image storage solution

1. Download images as gzipped base64
 2. Squeeze $2\frac{2}{3}$ base64 characters into one UTF-16 character
 3. Push that into the database
 4. Reverse when rendering the page
- Go to <http://labs.ft.com/> to read more.

Tips for coping with the network

- Batching your requests
- Prioritise requests
 - User requested content first
 - Analytics last
- Progress bars
 - Show feedback fast
 - Be pessimistic

One HTTP request!

- Aggressive batching - collect requests asynchronously:

```
api.add('getStory', {'path': '/1'}, callback1);  
api.add('getStory', {'path': '/2'}, callback2);  
api.send(callback3);  
api.add('analytics', params, callback4);  
api.send(callback5);
```

- Callbacks per action and per group

Going native

Acclimatised users

- Android
 - Back and Search buttons
 - Sharing: `Intent.ACTION_SEND`
 - Widgets
 - Background content downloading
- Windows 8
 - Sharing and Search charms
 - Home screen tile
 - Nav bar

Search on Android

The screenshot displays the Financial Times mobile application interface on an Android phone. The top navigation bar includes the FT logo, a 'Sign in or subscribe' button, and the 'FINANCIAL TIMES' title. A search icon is visible in the top right corner. The main content area features a news article titled 'Obama carried to victory on midwest vote' with a sub-headline 'Exasperated allies' and a photo of Barack Obama. A search overlay is active, showing a search bar with the text 'Find news' and a 'NO RECENT SEARCHES' message. The overlay also includes 'News' and 'Quotes' buttons. The bottom of the screen shows the Android navigation bar with back, home, and recent apps icons, along with the time '10:14' and signal strength indicators.

FT Sign in or subscribe

FINANCIAL TIMES

Exasperated allies
Complex relationship of Cameron and Merkel

The fine line
Forecasts must account for political risk

United Kingdom Android edition

9:12 PM

Obama carried to victory on midwest vote

Jubilant Democrats took to the streets of Chicago and Washington to celebrate what looked like another historic victory for the first African American president.

11:01 AM

America's real test comes after polls

Financial Times editor Lionel Barber writes there are solutions but no challenge is inherently insurmountable for the most powerful nation on earth

11:54 AM

Myners takes aim at M&S performance

Criticism by former chairman comes as retailer reports a 10 per cent decline in first half pre-tax profit and sales of clothing and homewares continue to fall

News Quotes

NO RECENT SEARCHES

We live in FINANCIAL TIMES®

Special section

10:14 3G

Search on Windows 8

PERSONAL FINANCE

10:33 PM Monday

Banks plea for right to sell derivatives



In their evidence to a Parliamentary Commission probe, the leaders of HSBC, Barclays and Santander UK say that the products are crucial to SMEs

6:20 PM Sunday

Many mortgages still interest-only



Moody's finds 52.6% of London loans are to borrowers not making repayments of principal and geographic clusters of such loans can raise lenders' risks

5:03 PM Sunday

Student housing is top property asset

Rise in student numbers is generating double-digit returns in US and UK, outperforming equities, gilts and other property investments

Mortgages Investments Pensions Tax Banking & Savings

Bank pulls out of British expat mortgages Mortgage snapshot shows fortunes vary Germans warm to property own

Search

Financial Times

 X 🔍

Apps

Settings

Files

Financial Times

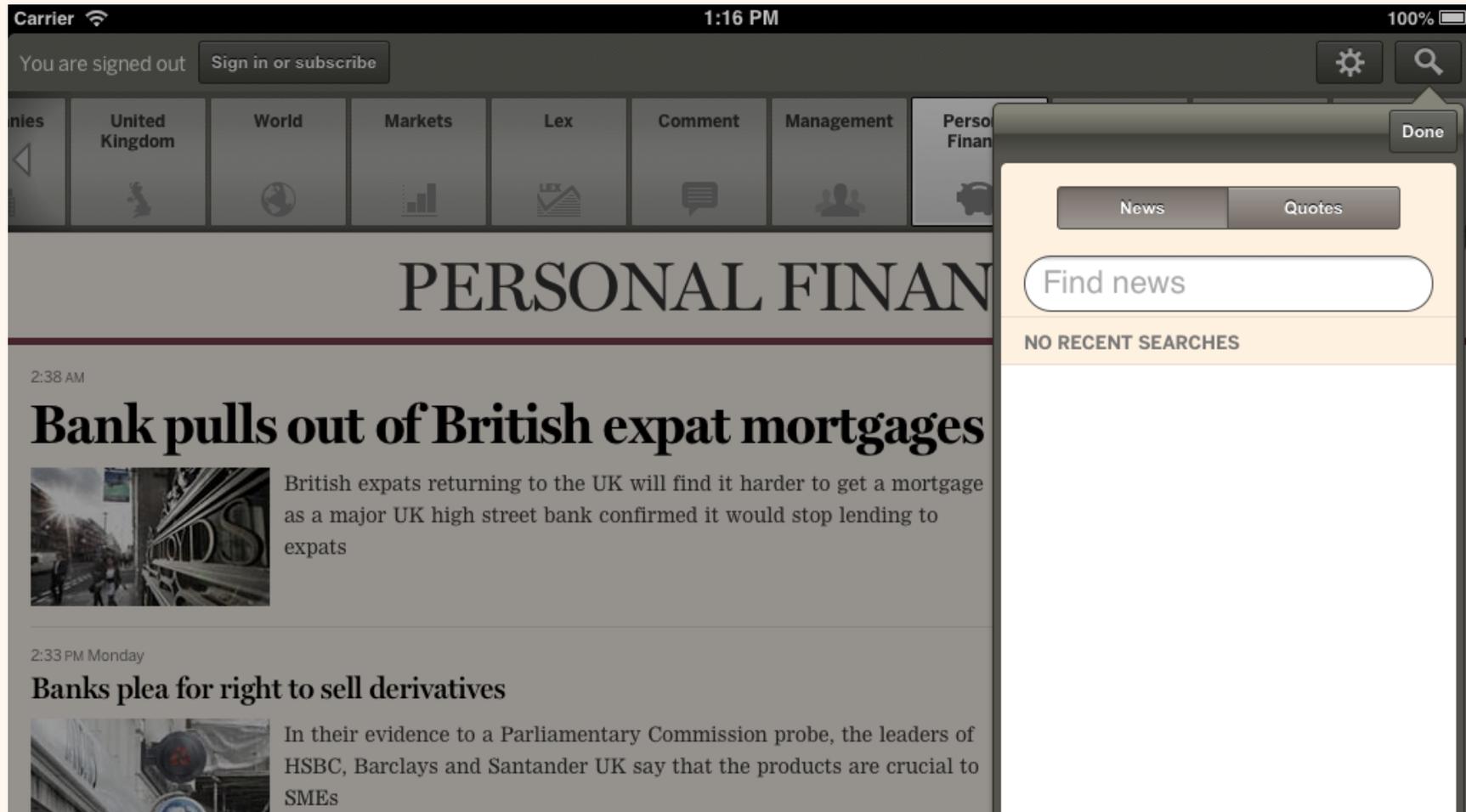
Store

Bing

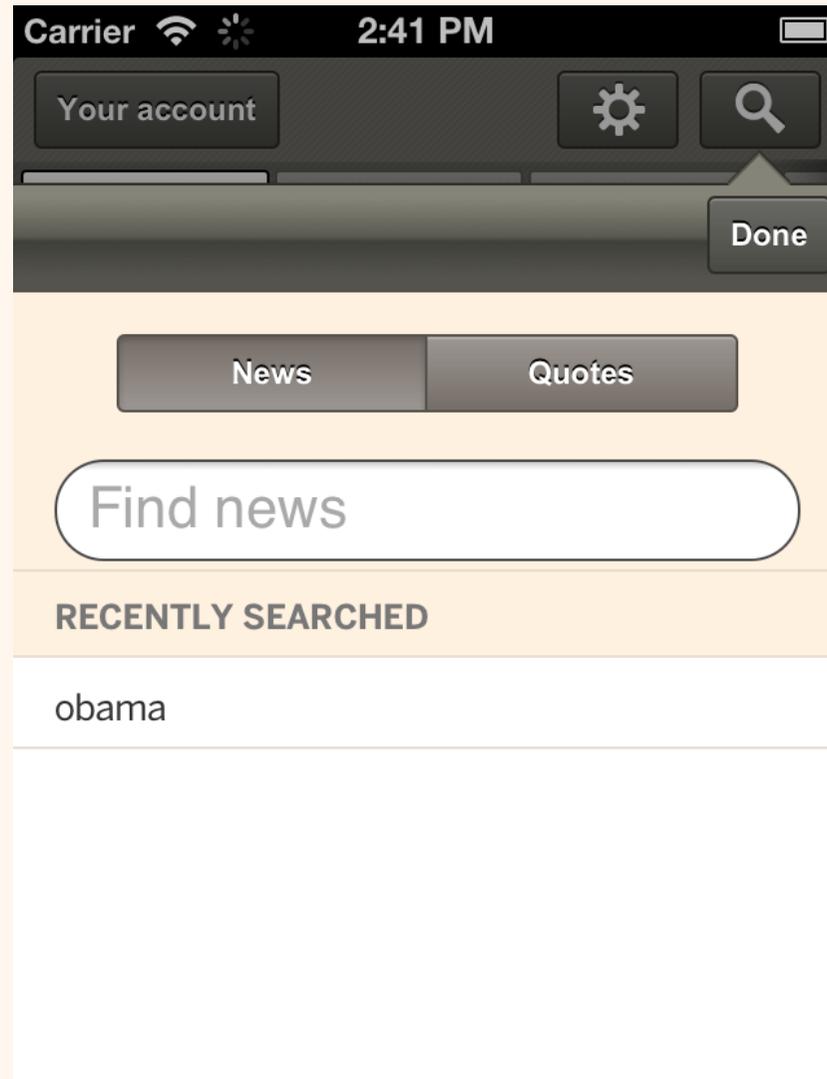
Finance

Games

Search on iPad



Search on iPhone



Native wrappers

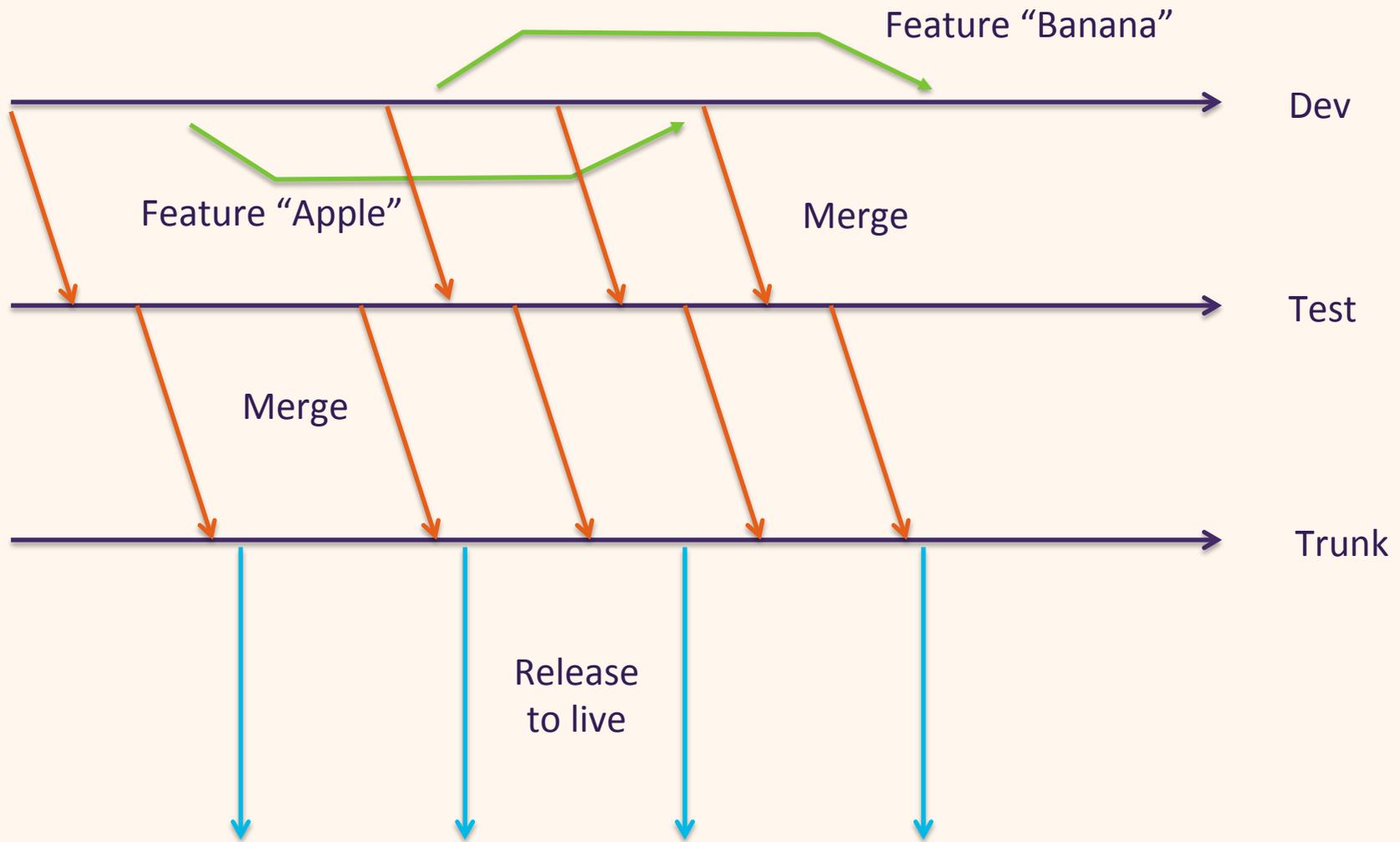
- Invoke same core online web site
- Wrapper to web communication
 - via HTML5 postMessage
 - JavaScript function calls

But with multiple devices, surely

Managing the release process

is hard?

The Old Days: Branches



The alternative: Feature flags

- Develop in one place
- Switch bits of code on and off

```
if (Flags.get('WidgetEnabled')) { ... }
```

- Centralise those switches

```
function get(flagname) {  
  switch flagname:  
    case 'WidgetEnabled':  
      return isAndroid  
    ...  
}
```

- Don't associate multiple things to the same flag

Feature flags: Override for testing

Screenshot of flag tool

	Default	Base	Override
Use HTML5 Application cache The app cache stores files in a simple local cache which can be accessed when the browser is not connected to the network. If the app cache was already loaded before it was disabled using this interface, the server will attempt to obsolete it by responding with HTTP 410.	true	true	<input checked="" type="radio"/> true <input type="radio"/> false
API backend The HTML5 app does not have a database of subscribers. When you log in, it needs to contact the registration servers to validate your account.	"live"	"live"	<input checked="" type="radio"/> live <input type="radio"/> stage <input type="radio"/> badapi
Use JPEG2000 JPEG200 is a different way of compressing images. Its support across devices is unclear, and the level of compression it brings is still being evaluated.	false	false	<input checked="" type="radio"/> true <input type="radio"/> Cancel

Feature flags: Override for testing

- Code example:

```
function get(flagname) {
  flagoverrides = JSON.parse(localStorage.getItem('flags'));
  if (flagname in flagoverrides) {
    return flagoverrides[flagname];
  }
  switch flagname:
    case 'AppleEnabled':
      return isAndroid
    ...
}
```

Feature flags 2.0

- Server-side decisions control client side behaviour
 - Enable A/B feature release
 - Deploy features to different platforms
 - Push flags to client
- Share flags client and server side
 - Get feedback on A/B testing
- Remember analytics!

Client-side code updates

- The bootstrap code:
 - Runs what's in localStorage
 - Asks the server if there's a new version
 - Allow beta users to get version first
 - Downloads it for use next time
- Minimises AppCache aggravation
- Gives us complete control

Final points

HTML5 sites can be **great**

But building a good HTML5
site is **very hard**.

“The biggest mistake we made as a company was betting too much on HTML5 as opposed to native,”

“It just wasn’t ready”



Summary

- Less **separation**, more **adaptation**
 - Fewer, more adaptive websites
- Less **native**, more **web**
- HTML5 is NOT just a mobile solution, but a way of **making better websites**.
- Responsiveness is not about multiple static designs, it's a multi-variable equation

Summary

- appCache + localStorage + intelligent bootstrapping + good use of storage
= **reliable offline app**
- You don't have to sacrifice features
- With good optimisations you can get a great app experience

We're trying to help

- Your dev team can use our code
 - github.com/ftlabs
- We blog about techniques at labs.ft.com
- Talks at conferences like this one

“Don’t build **native apps**,
build **web apps**”

- Tim Berners-Lee



Thanks

rob@labs.ft.com

@FTLabs

Do you want to build this stuff? **Join in.**

jobs@labs.ft.com

Image credits:
<http://cdn3.worldcarfans.co/2008/2/medium/9080214.017.Mini1L.jpg>, <http://www.netbasic.com/blog/2008/10/mini-car-parking-fail>, <http://runningstopsigns.files.wordpress.com/2011/04/smart-car.jpg>